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ABSTRACT

This guide provides information for planning a field trip to the Indiana Limestone District. This district, located in Monroe and Lawrence Counties, Indiana, is responsible for material that has dominated the building-limestone market in the United States for nearly a century. A few of the many well-known buildings using Indiana limestone are the Pentagon, Empire State Building, and Chicago Museum of Science and Industry. This guide is organized into five parts: part 1 contains detailed background information on the Indiana Limestone District; part 2 features miscellaneous information including an Indiana geological map, a graph of Indiana dimension limestone production, and a list of prominent buildings and monuments; part 3 contains the field trip guide, which features a detailed route through Monroe and Lawrence counties with numerous sites of interest identified and described; part 4 is a glossary of building stone and masonry terms; and part 5 contains a 33-item list of resource materials, including a bibliography, videocassettes, audio-tape cassettes, and maps. Two appendices include the dimension limestone production in Indiana and the United States; and a chronological history. (DB)

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QUARRY QUEST

A Field Trip Guide to the Indiana Limestone District, Monroe and Lawrence Counties, Indiana

Prepared for
The Indiana Council for Social Studies
Spring Meeting

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by
Sherman N. Shewmaker

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April 27, 1991

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PART I

INDIANA LIMESTONE DISTRICT

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Geological Society of America Centennial Field Guide—North-Central Section, 1987

The Indiana building-limestone district, south-central Indiana

John B. Patton and Donald D. Carr, Indiana Geological Survey, 611 North Walnut Grove, Bloomington, Indiana 47405

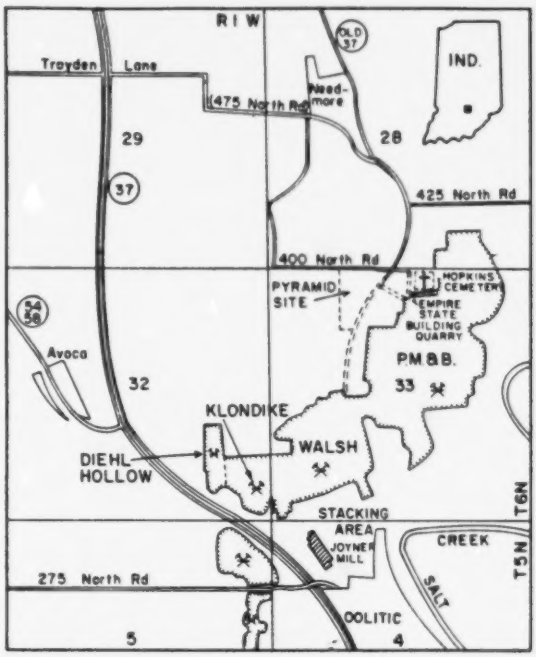

Figure 1. Outline map of the Pyramid Site and vicinity in south-central Indiana showing access routes and active and abandoned dimension-stone quarries. Section lines (1 mi (1.6 km) on a side) provide scale.

LOCATION

The best public access to quarries from which the noted Indiana Limestone (trade name) is produced is at a park and demonstration center in the NE¼NW¼Sec.33,T.6N.,R.1W., Lawrence County, Indiana (Oolitic 7½-minute Quadrangle), and lies 1 mi (1.6 km) north of Oolitic, which is, in turn, some 3 mi (4.8 km) north of Bedford, the county seat of Lawrence County (Fig. 1).

The site may be reached by passenger car or bus. Visitors approaching from the south by 4-lane Indiana 37 should pass the turnout to the north part of Oolitic and proceed 2.3 mi (3.7 km) to Trogden Lane, turning right (east) there and passing through Needmore to the old 2-lane route of Indiana 37 (1.2 mi [1.9 km]). Turn right (southeast) and proceed half a mile (0.8 km) to the entry for the Indiana Limestone Tourist Park and Demonstration Center.

Visitors approaching from the north by Indiana 37 (4-lane) will pass a stoplight intersection with Indiana 45 at the southwest edge of Bloomington and proceed 7.7 mi (12.3 km) to the place where the road descends from the upland in a deep bedrock cut through the lower part of the Salem Limestone, the entire Harrodsburg Limestone and Ramp Creek Formation, and the upper few feet of the Borden Group (Middle Mississippian). The highway crosses Clear Creek about 0.3 mi (0.5 km) south of the cut, and 2.2 mi (3.7 km) south of the bridge the new highway intersects old Indiana 37 at a blinker light. Turn left (southeast) and proceed 3.8 mi (6 km), passing Needmore on the right, to the entrance of the Center.

At the time of this writing, it is planned that the Center will be open (entry fee will be charged when fully in operation) from late spring until early fall. At other times, special arrangements must be made through Mr. Alvin Walker, Bedford Chamber of Commerce, 2999 West 16th Street, Bedford 47421 (phone: 812/275-4493). Even during the summer, it would be well for visitors to check in advance concerning open days and hours.

Just south of the Center, beyond the south end of the former highway, the Indiana Limestone Company quarries dimension stone during the season (approximately April to November), and to cross onto company property, visitors must obtain advance permission from Indiana Limestone Company, Inc., 405 I Street, Bedford 47421 (phone: 812/275-3341).

SIGNIFICANCE

Material quarried from the Salem Limestone has dominated the building-limestone market in the United States for nearly a century. In early years, the Salem was used principally for local markets, but with the coming of the railroads in the 1850s, the market for the Salem greatly increased. By the 1870s, a substantial volume of stone was reaching Indianapolis, Chicago, New York City, and Washington, D.C., points encompassing an area that currently is the principal market for Indiana Limestone. The names of buildings using Indiana Limestone are legend, but a few well-known examples are the Pentagon, Washington Cathedral, Empire State Building, Rockefeller Center, Chicago Museum of Science and Industry, Indiana state capitol, and American United Life Insurance Company building in Indianapolis, the state's tallest.

Although the outcrop belt of the formation extends for more than 100 mi (160 km) within southern Indiana and quarrying formerly took place at widely dispersed localities, the industry has for some 70 years been localized within a region that extends from a short distance south of Bedford to some 15 mi (24 km) northwest of Bloomington. The Center site is in the most intensively exploited part of the district. Visitors can view vast areas of quarried land, study the bedrock stratigraphic section and the character of the rock quarried and the overburden, and observe the methods of removal. To the south, active quarrying may be seen (by access permission) on property of the Indiana Limestone Company.

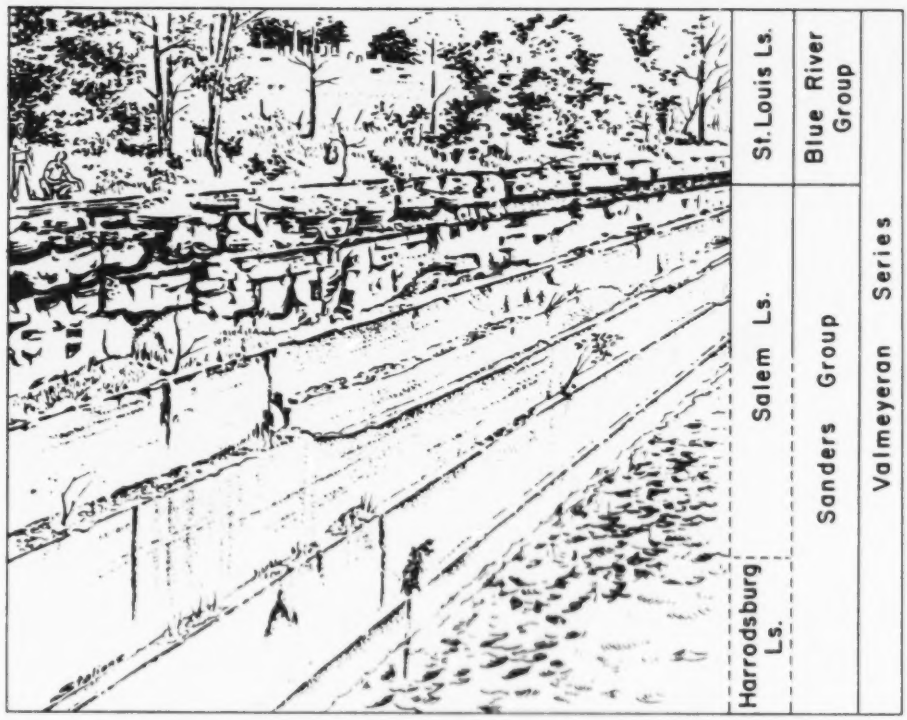

Figure 2. Sketch, as seen from the west side, of the north face of the Empire State Building Quarry showing general stratigraphy of the Indiana building-limestone district. This quarry is part of the large complex of active and abandoned quarries of the Indiana Limestone Company near the Pyramid Site as shown by Figure 1.

SITE INFORMATION

The Center is on a tract of land donated by the Indiana Limestone Company and adjacent to a complex of quarries covering more than 300 acres (Fig. 1).

Directly east of the Center (across a former highway and accessible by foot along a road surfaced with crushed stone) is the quarry from which stone for the Empire State Building was taken (Fig. 2). The stratigraphic section in the north wall exposes, beneath thin residual soil, a variable thickness of the St. Louis Limestone, identifiable from the observation point by its visibly bedded units ranging from a few inches to a foot (30 cm) or more in thickness. Beneath the St. Louis is the massive Salem Limestone, from which the building material is taken, but the uppermost 10 ft (3 m) of the massive section is the "bastard stone" of local terminology—an impure silty dolomitic limestone. Both it and the overlying limestone in the lower part of the St. Louis formation were and are discarded as overburden where present. Directly below the bastard stone is an 8-ft (2.4 m) cut, called "second ledge," meaning that the stone is inferior grade but that parts of it are usable for some purposes. Below the second ledge is about 60 ft (18 m) of usable building stone, but at the time of writing in October 1983, a part of this stone was below water level. The lowermost exposed limestone is the Salem, giving a total thickness of about 80 ft (25 m), but the contact with the Harrodsburg Limestone is not far below. In places, the uppermost beds of the Harrodsburg so resemble the Salem that building-stone quarriers have dropped their lowest ledges below the contact. In general, however, the upper Harrodsburg, even where it resembles the Salem building stone, has coarser texture, is less well sorted, and tends to lose the massive character that permits the removal of sound blocks.

At lower positions relative to the topographic surface, where Salem stone of dimension quality directly underlies the soil, deep, vertical, clay-filled solution joints called "grikes" are likely to be present and cause some loss of recoverable blocks.

The part of the formation that came to be developed as a premium building material of national and international renown

is a freestone—one that has virtually the same workability in all directions and shows little preferential direction of splitting. It is a relatively pure, massive, evenly granular, fine-grained, moderately porous limestone, crossbedded in places, that consists of small fossils and fossil fragments cemented by calcite. The original color ranges from light gray to bluish-gray, but the rock is oxidized to shades of buff to varying depths below the surface, in some places massively and in others along bedding planes and joints. This oxidation gives rise to the three principal color categories—gray, buff, and variegated (mixed gray and buff).

Although quarrying may not be taking place, at least within sight at the time of a visit, even viewing the inactive quarries enables spectators to understand the geologic situation and the practices and methods of the industry.

Overburden may be: (1) residual soil generally red immediately above the stone; (2) bedrock not suitable for building stone, either the lower part of the overlying St. Louis Limestone or ledges of Salem that are impure or too hard for satisfactory milling; and (3) surficial layers that have the lithology of the building stone but that are too weathered, irregular, or jointed to yield sound blocks of usable size. Unconsolidated overburden is removed by bulldozer and scraper, and clay from irregularities is removed by some hand labor. Rock overburden may be loosened by drilling and blasting before removal, but explosives must be used with wariness to prevent damage to the underlying building stone. The lowermost part of the rock overburden, the second ledge, whether stone or unsuitable lithology or weathered and irregular building stone, is generally removed by the same methods used for producing mill blocks. In some places, blocks can be salvaged for housing veneer or for uses other than cut stone.

Waste stone so quarried must be placed somewhere, and in opening a new quarry, operators may need to stack waste blocks adjacent to the quarry opening. Therefore, the ground needed for later quarry expansion may be covered, and the waste blocks may have to be handled a second time. Besides the overburden removed as block, some of the stone quarried from the working ledge must generally be set aside because of irregular shapes that do not justify gang sawing or because of weathering, color, texture, or flaws that cause its rejection. Some of the "grout" piles, as they are called, are stacked in orderly fashion, but others are tumbled masses of mixed large blocks and unshaped fragments.

Once a quarry opening has been developed to its full intended depth, block overburden, nonblock overburden, and rejected material from adjacent working ledges may be placed in the abandoned opening. Many such former quarry holes are no longer recognizable, as they have been graded over and even paved or vegetated.

The principal methods for separating stone from the ledge involve the use of channeling machines or of wire saws. Channelers are mobile devices that travel on narrow-gauge tracks, moving slowly back and forth over the prescribed length of the particular cut that they are making. They deepen a channel on one side of the tracks, or two channels straddling the tracks, a fraction of an inch to several inches at each pass through the pounding of a set of bits at the bottom of sheaved, chisel-ended rods actuated by a cam or directly by a piston. The depth of the channel cut may range from as little as 5 or 6 ft (1.5 to 1.8 m) to 13 ft (4 m) or more and may be determined by a change in the character of the stone at some depth that would make it impractical to add another foot or two of a different lithology to the ultimate block. In other places the lithology remains unchanged from the ledge being channeled to the underlying ledge, and in such places the depth of the channel cut will be the maximum that equipment can cut or transport effectively or that the mill can use efficiently. For the most part, the successive ledges in a deep quarry are not bottomed at bedding planes or other necessary limitations, and the ledges are commonly of fairly consistent height. A channel cut cannot be made flush with the quarry walls, and therefore each successive downward ledge steps inward about a foot (.3 m).

Wire saws are now considered to be more economical to operate than channeling machines. A power-driven endless helical wire is drawn, initially over the surface of the ledge and later in its own slot, carrying a mixture of water and quartz sand as abrasive. The wire is under tension, exerting constant pressure on the bottom of the slot and feeding over sheaves that slowly descend as the slot deepens. The resulting cut is slightly convex but may be flattened at the end of the run by continued operation under tension. Typically a single length of wire, actuated by a power unit that may be out of sight over the quarry rim, is so rigged over an elaborate assembly of pulleys and posts that it is performing many cuts at different places in the quarry simultaneously.

At the lateral extremities of the floor to be quarried, other cuts must be made perpendicular to the parallel channels or wire-saw cuts thus described; and unless the entire width of the ledge is to be handled in the next step as a single unit, intervening crosscuts are made at intervals of 30 to 60 ft (9 to 18 m) and to the same depths. Once a mass of stone, perhaps 4 ft (1.2 m) wide by 10 ft (3 m) high by 30 (9 m) or 40 ft (12 m) long and weighing more than 100 tons, has one long exposed face and vertical cuts at the back and ends, it must be freed from the bedrock below. Jackhammer holes, spaced less than a foot apart, are drilled as near the base and as nearly horizontal as possible. Into these, wedges are driven, forcing apart metal half sleeves called "slips" (to transmit the force back into the stone and prevent it from simply shattering around the hole). Broken stone less than a cubic foot in size is stacked on the new lower floor in a row of piles called "pillows," and the underdrilled and wedged-free cut is turned down, generally by using wire rope attached through sheaves to a power source, onto the pillows, which are intended to prevent breakage of the cut as it topples. Once on its side, the cut is sectioned into quarry blocks of the size desired by using wedges and slips in pneumatic-drill holes.

In this part of the American Midwest, clastic sedimentation was dominant during both the beginning and ending of Mississippian time, but carbonate deposition prevailed during Middle Mis-

sissippian time, accumulating to more than 400 ft (120 m) of stratigraphic section in this area. Although this thick carbonate section was marked by episodes of clastic and evaporitic deposition, the part of the Salem that is used for building stone is thought to have been deposited in warm, clear, shallow-marine water—warm enough to sustain an abundant invertebrate fauna; clear enough to have yielded almost no clay or other inorganic sediments; and sufficiently shallow to permit wave action and marine currents to macerate the larger units of shell material, to winnow the organic detritus to remarkedly uniform grain sizes, and to distribute calcarenite sand consisting of small fossils and well-graded fragments of larger organisms over thousands of square miles of Mississippian sea floor.

Bimodal orientation of crossbedding suggests that these marine sands moved back and forth on a southwestward-dipping paleoslope in response to ebb-and-flood tidal currents (Sedimentation Seminar, 1966, p. 112–113, Figure 6), but how far eastward the building-stone lithology extended from the belt of present exposure is unknown. Rock of similar lithology is not present eastward from the Cincinnati Arch, but no evidence is found in three-dimensional study of the building stone to suggest that the present outcrop belt approaches an eastward terminus. A landmass, one that contributed terrigenous debris, must have been tens to hundreds of miles away, because its contribution to the Salem building-stone facies was slight. Discontinuous beds of silty and less calcareous materials were deposited locally, which interrupted the sequence of building-stone deposition in some places and capped it in others. Westward into the subsurface, the building-stone lithology of the Salem extends to the Illinois-Indiana line (Pinsak, 1957, p. 25–26, 34–36, plate 1) and beyond the center of the Illinois Basin, a distance of 150 to 200 mi (240 to 320 km) from the Indiana outcrop.

Some of the material apparently underwent little distance of transport, as mats consisting largely of delicate fronds of fenestelloid bryozoans are found in places—broken, it is true, to fragments only a few millimeters in long dimension, but still probably too fragile to have withstood any major distance of transport. The greater part of the building-stone bank is heterogeneous in organic composition, the only common character being particle size, and we must conclude that the greater part of the building stone is composed of winnowed material that was not derived mainly from invertebrate fauna of the immediate vicinity. A considerable vogue existed in the early part of the century for considering the Salem to contain a so-called "dwarf fauna" (Cumings and Beede, 1906, p. 1189–1200; Smith, 1906, p. 1220, 1237–1242), and speculations were advanced to explain environmental conditions that could have caused stunting of various species. The Salem fauna rather than being dwarfed, however, consists of minute species, of infantile forms of larger species, and of fragments from organisms of normal size.

The Salem has become a remarkable building stone not only because geologic events leading to its discovery were just as they should be, but also because its location and suitability for exploitation allowed a product to be produced that people wanted and could afford. The market for the Salem has varied through the years, but performance of the stone has held up for well over a century in buildings and monuments of all sorts, distributed through a wide diversity of climates and environments. Aesthetic appeal, reasonable cost, and permanance are properties of the stone that have brought the Indiana Limestone industry to its prominence today; these properties ensure its success in the future.

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PART II

MISCELLANEOUS INFORMATION

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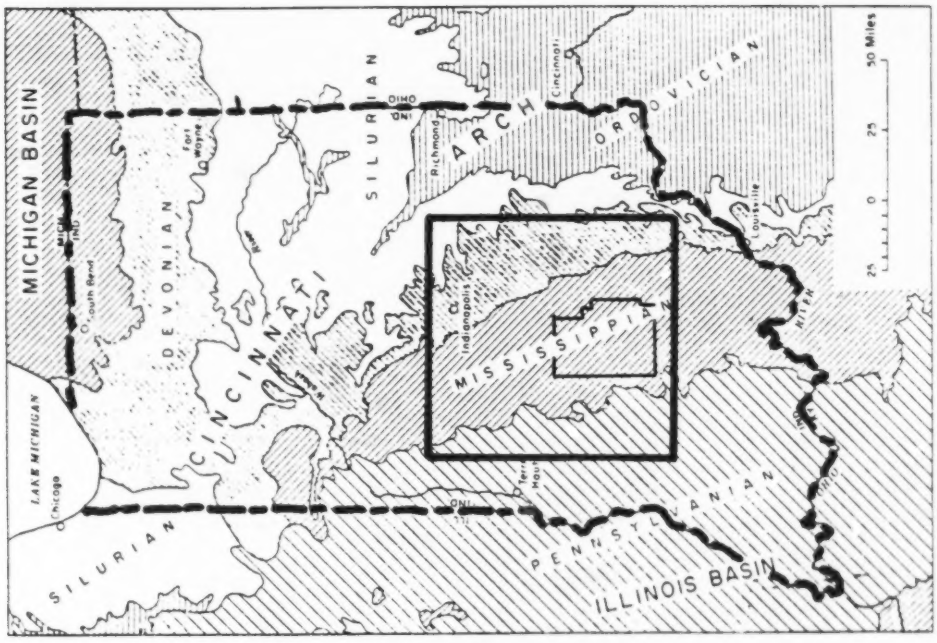
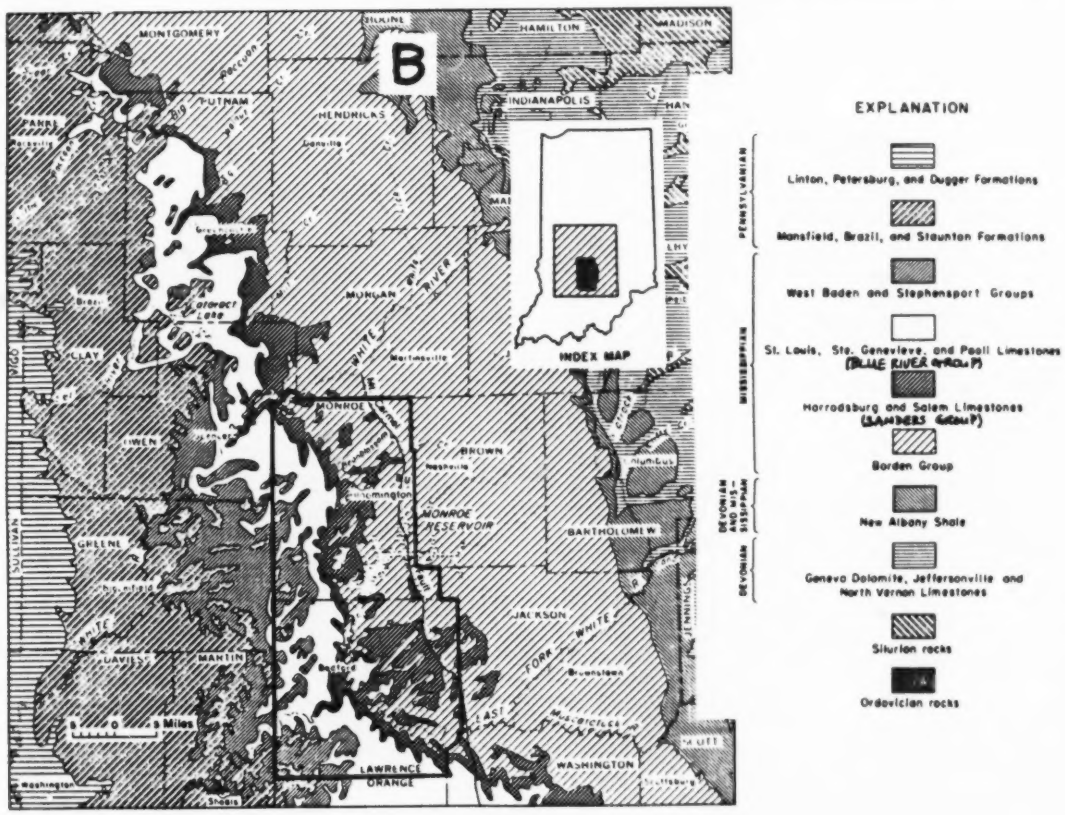
INDIANA GEOLOGICAL MAP





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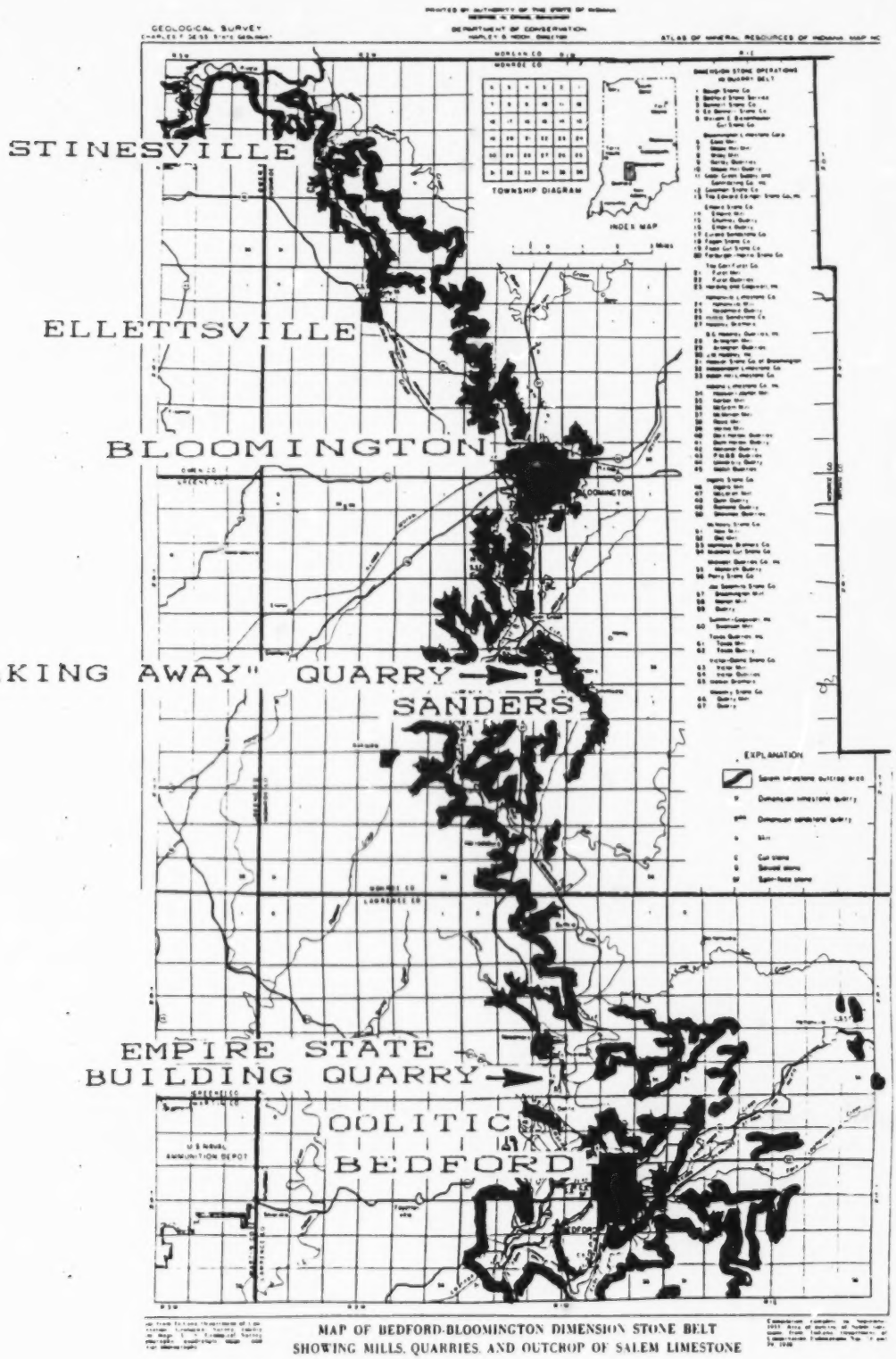
MAP OF SALEM LIMESTONE



MAP OF BEDFORD-BLOOMINGTON DIMENSION STONE BELT
SHOWING MILLS, QUARRIES, AND OUTCROP OF SALEM LIMESTONE

By Ned M. Smith
1956

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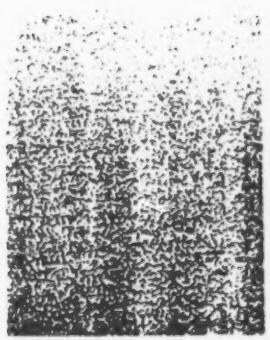
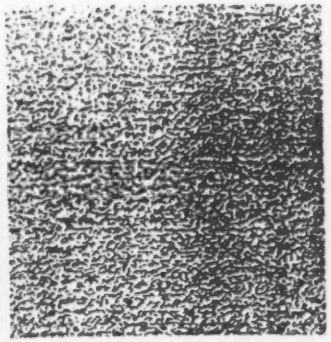
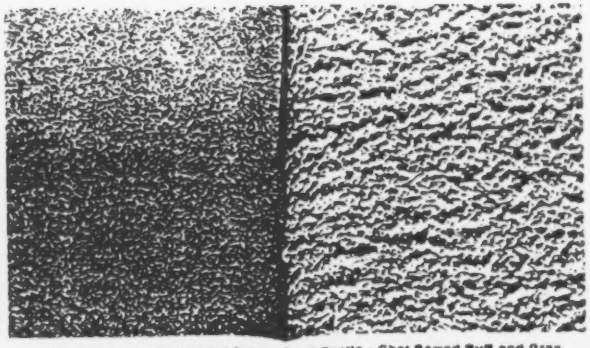


(1) Select - Rubbed Finish Buff and Gray



(2) Standard - Smooth Planer Finish Buff and Gray



(3) Standard - Variegated Colors | (4) Rustic - Chat Sawed Buff and Gray

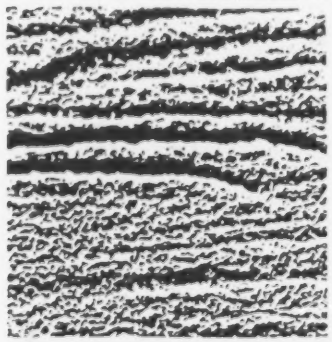
GRADES

SELECT (1): This Indiana Limestone embraces the finer grained stock, in which only minor variation in texture is allowed. It is particularly adapted to the elaborate class work, involving molding and trim and carved or sculptured detail.

STANDARD (2): The average of the moderately grained Indiana Limestone which constitutes the bulk of the total output. Adapted to work where uniformity of color and texture is desired and where cost is a consideration. Recommended for ashlar fields in commercial and monumental buildings.

RUSTIC (4): The coarser, more granular Indiana Limestone having a varying amount of crystalline calcite intermixed, including stone with honeycomb formation. Well adapted for architectural design where a full range of coarse texture is appropriate and especially where cost is a major consideration. It is recommended where rough shot sawed or chat sawed is desired.

OLD GOTHIC (5): Indiana Limestone without limits as to color or texture. It is especially suitable where full variation of texture and color is desired and is well suited to shot sawed patterns with full range of color tones.



(5) Old Gothic - Rough Shot Sawed

FINISHES (SURFACES)

RUBBED (1): Sand or carborundum and water rubbed finish recommended where a smooth dirt and grime resisting finish is desired.

SMOOTH PLANER (2): The standard planer finish that is recommended for an economical smooth surface where it is desirable and appropriate.

CHAT SAWED (4): A coarse, unevenly grooved surface for ashlar of filed work where a rough textured surface is desired.

ROUGH SHOT SAWED (5): A coarse, uneven, grooved surface with random markings. This finish emphasizes strong horizontal or vertical architectural lines.

SPLIT FACE (6): A rough, uneven, concave convex finish that preserves the attractive natural appearance and creates maximum play of light and shadow through its bold and striking texture. An economical finish in various course heights up to 10 1/2 inches in random lengths.

OTHER FINISHES (not shown): These finishes include SAND SAWED, CARBORUNDUM, HONED, TOOLED, PLUCKED, HAMMERED, PITCHED, BUSH HAMMERED, and many others to specification as desired.

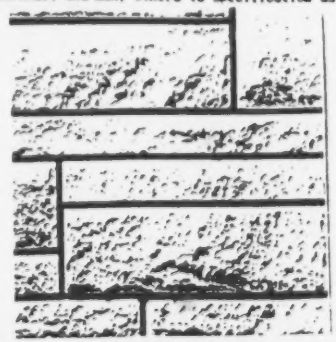
COLOR TONES

Indiana limestone is quarried in two color tones, each of varying shades of "Buff" and "Gray" and in an irregular mixture called "Variegated."

BUFF: This stone varies from a very light creamy buff to a brown buff.

GRAY: A silvery gray stone with a slight bluish cast.

VARIEGATED: Consists of both buff and grey stone with some stone containing both color-tones.



(6) Split Face Finish - Buff, Gray, or Mixed

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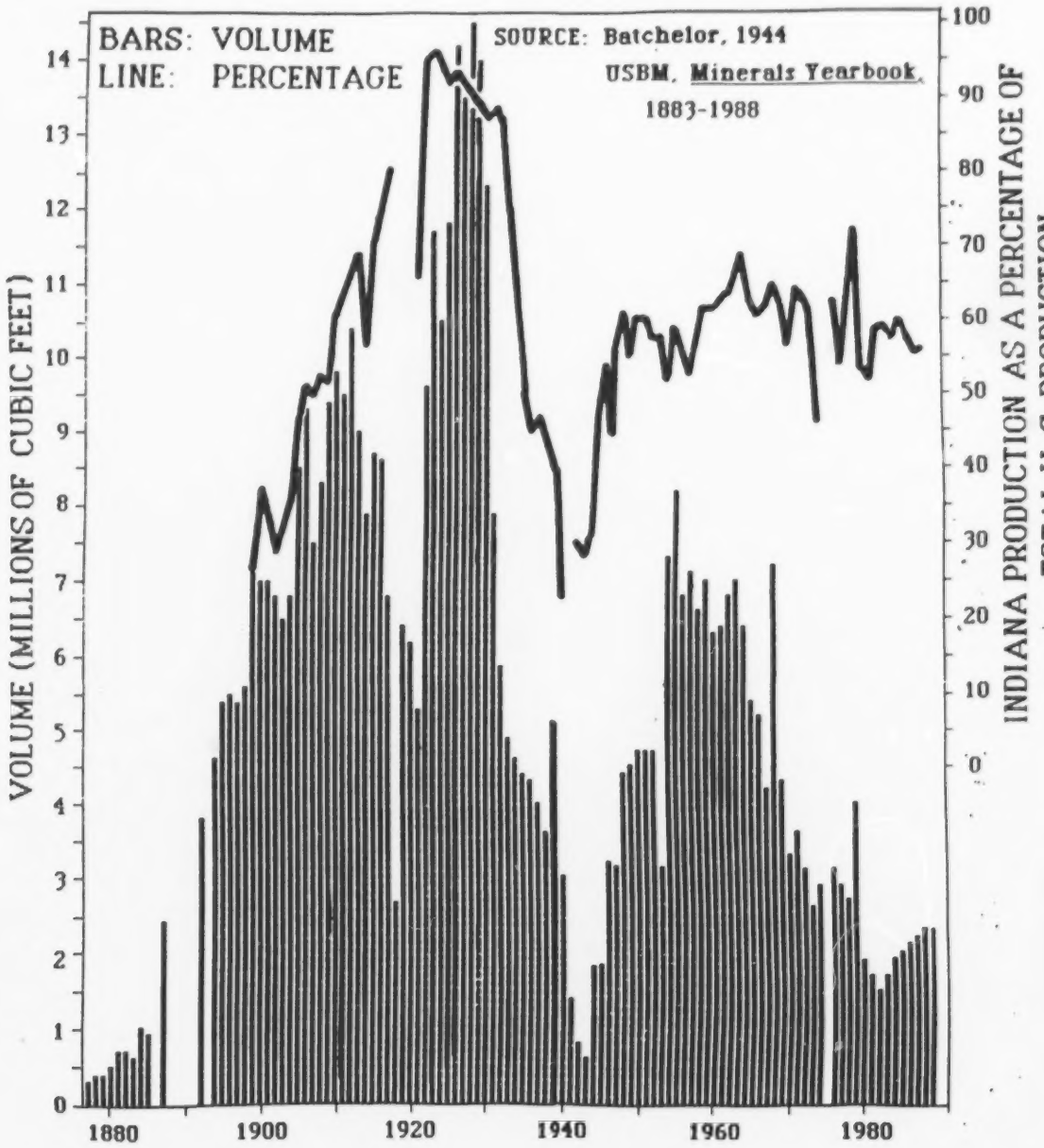
INDIANA DIMENSION LIMESTONE PRODUCTION



LIST OF PROMINENT BUILDINGS/MONUMENTS (BUILT OF INDIANA LIMESTONE)

BUILDING	CITY	STATE
Archives Bldg	Washington	DC
British Embassy	Washington	DC
Bureau of Printing and Engraving	Washington	DC
Dept of Commerce Bldg	Washington	DC
Dept of Interior Bldg	Washington	DC
Dept of Justice Bldg	Washington	DC
Dept of Labor Bldg	Washington	DC
Internal Revenue Service Bldg	Washington	DC
Lincoln Memorial (interior)	Washington	DC
National Cathedral	Washington	DC
Pentagon	Washington	DC
Georgia State Capitol	Atlanta	GA
Tribune Tower	Chicago	IL
Merchanise Mart Bldg	Chicago	IL
Fine Arts Bldg	Chicago	IL
Indiana State Capitol	Indianapolis	IN
Monument Circle	Indianapolis	IN
Indiana War Memorial	Indianapolis	IN
Mayo Clinic Bldg	Rochester	MN
Geo W. Vanderbilt Residence	Asheville	NC
Nebraska State Capitol	Lincoln	NE
Cathedral of St. John the Divine	New York City	NY
Chase National Bank	New York City	NY
Empire State Bldg	New York City	NY
Irving Trust Bldg	New York City	NY
NBC Bldg	New York City	NY
Riverside Church	New York City	NY
Rockefellar Center Bldgs	New York City	NY
Saks Fifth Avenue Store	New York City	NY
W. K. Vanderbilt Residence	New York City	NY
U. S. Military Academy	West Point	NY
Union Terminal	Cleveland	OH
Soldiers and Sailors Mem Bridge	Harrisburg	PA
Mellon Institute	Pittsburg	PA
Tennessee State Capitol	Nashville	TN
Canadian Bank of Commerce	Toronto	Ontario

UNIVERSITIES WITH MAJOR BUILDING PROJECTS USING INDIANA LIMESTONE

Chicago	Iowa State	Northwestern
Duke	Kansas	Ohio State
Illinois	Michigan	Pittsburg
Indiana	Michigan State	Princeton
Indiana State	Minnesota	Purdue
Iowa	Nebraska	Wisconsin
		Yale

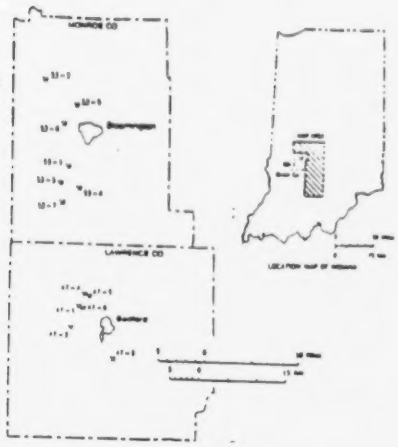
OTHER MONUMENTS IN NYC, NY

National Arts Club	15 Gramercy Pk So		
Federal Reserve Bank	33 Liberty St		
Building at	34 Gramercy Pk So		
Trinity Church	Broadway Av	&	Wall St
Woolworth Bldg	233 Broadway Av		
St. Patrick's Cathedral	Fifth Av	&	50th St
Villard Houses	Madison Av	&	50th St
St. Thomas' Church	Fifth Av	&	53rd St
University Club	Fifth Av	&	54th St
Fifth Av Presbyterian Church	Fifth Av	&	55th St
Maine Memorial	59th St	at	Columbus Circle
Washington Square Arch	Fifth Av	at	Washington Sq
Bas-relief, Northeast Corner	Madison Av	&	72nd St
Ralph Lauren Bldg, SE Corner	Madison Av	&	72nd St
Bethesda Terrace	Mid-Central Park	&	72nd St
French Consulate	Fifth Av	&	79th St

*Practically every college/university in the United States has buildings of Indiana Limestone.

DIRECTORY OF DIMENSION LIMESTONE QUARRIERS IN INDIANA (LAWRENCE, MONROE, OWEN COUNTIES)

(excerpted from Carr and others, 1989)



LAWRENCE COUNTY

ELLIOTT STONE CO., INC.
P.O. BOX 756
BEDFORD, INDIANA, 47421
47-1 DARK HOLLOW QUARRY, 1 MILE SOUTHWEST OF OOLITIC
OOLITIC QUAD.
NW1SW1 SEC. 9, T. 5 N., R. 1 W.
47-2 EUREKA QUARRY, 3.5 MILES WEST OF BEDFORD
BEDFORD WEST QUAD.
SE1SW1 SEC. 18, T. 3 N., R. 1 W.
DAVID W. ELLIOTT, PRESIDENT, JUDY ELLIOTT, SECRETARY-TREASURER
812-275-5536 (OFFICE)
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: MILL OPERATED IN SW1NW1 SEC. 26, T. 5 N., R. 1 W., SOUTH EDGE OF BEDFORD

EVANS QUARRIES, INC.
P.O. BOX 711
BEDFORD, INDIANA 47421
47-3 PALESTINE QUARRY, 3 MILES SOUTHEAST OF BEDFORD
BEDFORD EAST QUAD.
SE1NW1 SEC. 1, T. 4 N., R. 1 W.
LARRY EVANS, PRESIDENT
812-279-3697 (QUARRY)
QUARRY BLOCKS
SALEM LIMESTONE

INDIANA LIMESTONE COMPANY, INC.
403 I STREET, P.O. BOX 72
BEDFORD, INDIANA 47421
47-4 P. M. AND B. QUARRY, 1 MILE NORTH OF OOLITIC
OOLITIC QUAD.
NW1SW1 SEC 33, T. 6 N., R. 1 W.
47-5 BUFF RIDGE QUARRY (P. M. AND B. COMPLEX), 1 MILE NORTH OF OOLITIC
OOLITIC QUAD.
NE1SW1 SEC. 33, T. 6 N., R. 1 W.
47-6 DARK HOLLOW QUARRY
1 MILE SOUTHWEST OF OOLITIC
NW1SE1 SEC. 5, T. 5 N., R. 1 W.
OOLITIC QUAD.
NW1SE1 SEC. 5, T. 5 N., R. 1 W.
812-275-3341
JOHN D. TUCKER, CHIEF EXECUTIVE OFFICER; T. DEAN BARNS, PRESIDENT;
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: MILLS OPERATED ARE MCMILLAN, SE1NE1 SEC. 10, T. 5 N., R. W., NORTH EDGE OF BEDFORD, AND JOYNER, NW1NW1 SEC. 4, T. 5 N., R W., NORTH EDGE OF OOLITIC. SEE ALSO LISTING IN MONROE COUNTY

MONROE COUNTY

B. G. HOADLEY QUARRIES, INC.
P.O. BOX 1224
BLOOMINGTON, IN 47402
53-1 MAPLE HILL QUARRY, 2 MILE SOUTHWEST OF BLOOMINGTON
BLOOMINGTON QUAD.
NW1SE1 SEC. 18, T. 8 N., R. 1 W.
PAT FELL, PRESIDENT; BERT M. FELL, JR., VICE PRESIDENT; DAVID B. FELL, VICE PRESIDENT
812-332-1447
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: ARLINGTON MILL OPERATED IN SE1SE1 SEC. 19, T. 9 N., R. 1 W., ABOUT 1 MILE NORTHWEST OF BLOOMINGTON.

BYBEE STONE COMPANY
P.O. BOX 968
BLOOMINGTON, IN 47402
53-2 SMITH QUARRY, 6 MILE NORTH OF ELLETTSVILLE
BLOOMINGTON QUAD
NE1SW1 SEC. 3, T. 9 N., R. 2 W.
WILBUR C. BYBEE, PRESIDENT
812-876-2215 (ELLETTSVILLE)
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: MILL OPERATED IN NE1SW1 SEC. 3, T. 9 N., R. 2 W., 1 MILE NORTH OF ELLETTSVILLE. SEE ALSO LISTING IN OWEN COUNTY.

INDEPENDENT LIMESTONE CO
6001 SOUTH ROCKPORT ROAD
BLOOMINGTON, INDIANA 47401
53-3 QUARRY, 20 MILES SOUTHWEST OF CLEAR CREEK
CLEAR CREEK QUAD.
NE1NW1 SEC. 36, T. 8 N., R. 2 W.
W. CLAYTON HOLMES, GENERAL MANAGER, JOE ROSS, OFFICE MANAGER, CHARLES HUGHES, QUARRY SUPERINTENDENT
812-824-4951
QUARRY BLOCKS
SALEM LIMESTONE

INDIANA LIMESTONE COMPANY, INC.
403 I STREET, P.O. BOX 72
BEDFORD, INDIANA 47421
53-4 NATIONAL QUARRY, 1 MILE WEST OF SANDERS
CLEAR CREEK QUAD.
NE1SE1 SEC. 33, T. 8 N., R. 1 W.
812-275-3341 (BEDFORD)
JOHN D. TUCKER, CHIEF EXECUTIVE OFFICER; T. DEAN BARNS, PRESIDENT;
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: SEE ALSO LISTING IN LAWRENCE COUNTY

REED QUARRIES, INC.
P.O. BOX 66
BLOOMINGTON, INDIANA 47402
53-5 REED QUARRY, 1 MILE NORTHWEST OF BLOOMINGTON ON S.R. 46
BLOOMINGTON QUAD.
SE1SW1 SEC. 20, T. 9 N., R. 1 W.
EDWARD M. REED, PRESIDENT, STEVE REED, VICE PRESIDENT
812-337-2771
QUARRY BLOCKS
SALEM LIMESTONE

STAR STONE CO., INC.
P.O. BOX 85
CLEAR CREEK, IN 47426
53-6 STAR QUARRY, WEST EDGE OF BLOOMINGTON
BLOOMINGTON QUAD.
NE1 SEC. 30, T. 9 N., R. 1 W
ROBERT SMITH, PRESIDENT
812-824-8602 (OFFICE)
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: MILL (1) OPERATED NEAR QUARRY. OFFICE AND MILL (2) ABOUT 1 MILE SOUTHWEST OF CLEAR CREEK IN NE1NW1 SEC. 32, T. 8 N., R. 1 W.

VICTOR OOLITIC STONE COMPANY
P.O. BOX 668
BLOOMINGTON, INDIANA 47402
53-7 VICTOR QUARRY, 4½ MILES SOUTHWEST OF CLEAR CREEK
CLEAR CREEK QUAD.
SW1NE1 SEC. 12, T. 7 N., R. 2 W.
JOHN B. ENGLERTH, PRESIDENT; T. D. ENGLERTH, CHAIRMAN OF BOARD; AND DAVID M. HALL, GENERAL MANAGER
812-824-2621
QUARRY BLOCKS, FABRICATED STONE, AND MANY OTHER KINDS OF BUILDING STONE
SALEM LIMESTONE
REMARKS: MILL OPERATED IN SW1NE1 SEC. 12, T. 7 N., R. 2 W.

OWEN COUNTY

BYBEE STONE COMPANY
P.O. BOX 968
BLOOMINGTON, IN 47402
60-1 ROMONA QUARRY, 2 MILES NORTHEAST OF SPENCER
GOSPORT QUAD.
NW1NE1 SEC. 10, T. 10 N., R. 3 W.
WILBUR C. BYBEE, PRESIDENT
812-876-2215 (ELLETTSVILLE)
QUARRY BLOCKS AND FABRICATED STONE
SALEM LIMESTONE
REMARKS: MILL OPERATED ½ MILE NORTH OF ELLETTSVILLE. SEE ALSO LISTING IN MONROE COUNTY

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PART III

FIELD TRIP GUIDE

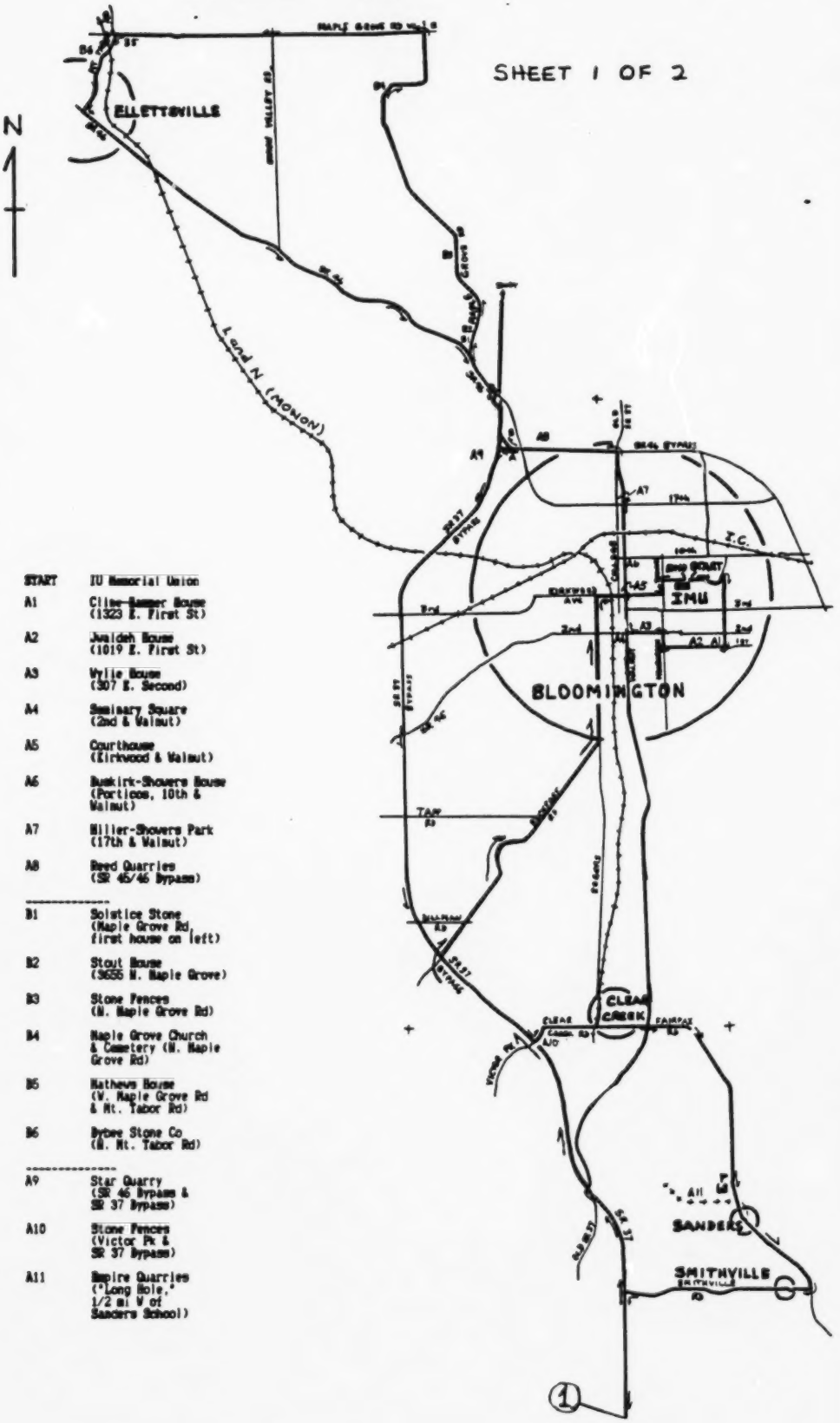
Page

Guide Map 15

Trip Description. 17

GUIDE MAP

SHEET 1 OF 2



START	IU Memorial Union
A1	Cline-Sampen House (1323 E. First St)
A2	Jwaideh House (1019 E. First St)
A3	Wylie House (307 E. Second)
A4	Seminary Square (2nd & Walnut)
A5	Courthouse (Kirkwood & Walnut)
A6	Buskirk-Showers House (Portico, 10th & Walnut)
A7	Miller-Showers Park (17th & Walnut)
A8	Reed Quarries (SR 45/46 bypass)
---	---
B1	Solstice Stone (Maple Grove Rd, first house on left)
B2	Stout House (3655 N. Maple Grove)
B3	Stone Fences (N. Maple Grove Rd)
B4	Maple Grove Church & Cemetery (N. Maple Grove Rd)
B5	Mathews House (W. Maple Grove Rd & Mt. Tabor Rd)
B6	Bybee Stone Co (N. Mt. Tabor Rd)
---	---
A9	Star Quarry (SR 46 Bypass & SR 37 bypass)
A10	Stone Fences (Victor Pk & SR 37 bypass)
A11	Empire Quarries ("Long Hole," 1/2 mi W of Sanders School)

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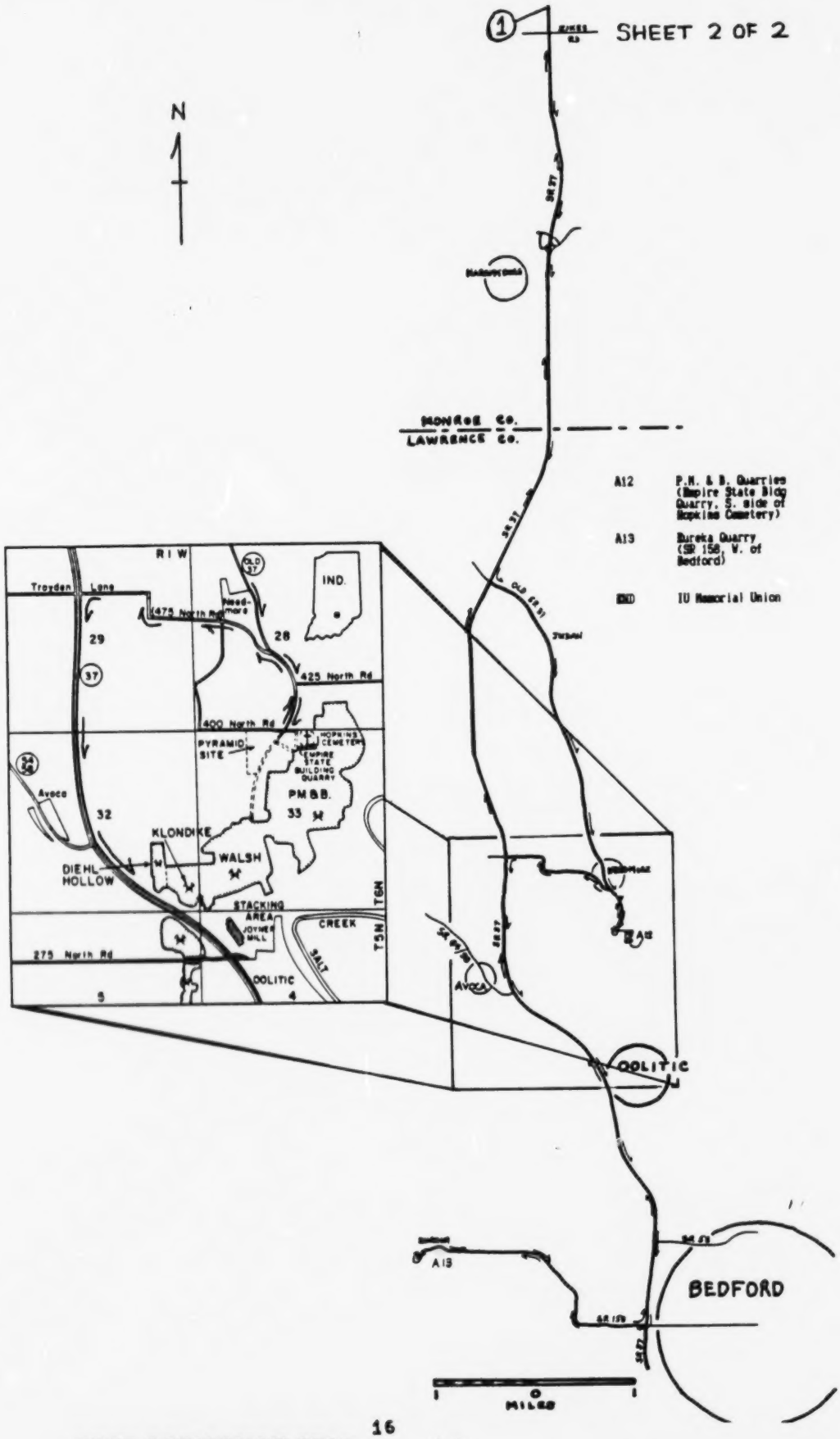
SHEET 2 OF 2



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TRIP DESCRIPTION

(NOTE 1: TWO OPTIONS for the Field Trip have been developed:
OPTION A: Weather permits HIKING.
OPTION B: Weather precludes hiking.
OPTION A is a shorter route and allows for some hiking; OPTION B involves staying on the bus and will therefore permit more driving time.

(NOTE 2: SITES of interest along the route are designated with alpha-numeric (e.g. A1) symbols indicating their OPTION and SEQUENCE along the route; MILEAGE indicates cumulative trip mileage (upper number) and between-site mileage (lower parenthesized number); mileages are indicated separately for each option.)

SITE	MILEAGE A	MILEAGE B	INSTRUCTIONS/DESCRIPTION
START	0.0	0.0	Set mileage at gate leaving front of Indiana Memorial Union; turn right (onto 7th St); proceed east around Showalter Fountain (Lilly Library on right) and IU Auditorium both constructed of sawed random ashlar; continue east to
	0.4	0.4	JORDAN AVE; turn right (south); proceed to
	1.1 (0.7)	1.1	FIRST ST; turn right (west); go to second house on right, which is the
A1			CLINE-HAMMER HOUSE (1323 E. First): Built by quarrier Kenneth Cline in 1928; above the door are the six anticipated Cline children, three on each side; however, only the little girl behind the chair-back (in the middle of the left-hand group) was ever born. (NOTE: the year this house was completed coincides with the peak year in Indiana dimension limestone production). Proceed west to
A2	1.4 (0.3)	1.4	JWAIDEH HOUSE (1019 E. First): Designed and built in 1941 by Chris Donato, a stone carver from Italy who eventually owned quarries and mills in the area. Proceed west to
	1.6 (0.5)	1.6	HENDERSON ST; turn right (north); proceed to
	1.8 (0.3)	1.8	SECOND ST; turn left (west); proceed to
A3	2.0 (0.2)	2.0	WYLIE HOUSE (307 E. Second): Built in 1835 by Andrew Wylie, a Presbyterian minister from western Pennsylvania and the first president of Indiana Seminary, established in 1820 (later Indiana University). NOTE the hand-hewn Salem limestone foundation (a typical early use in residences); age of stone fence unknown but pre-dates 1900. Proceed to

A4	2.1 2.1 (0.3)	WALNUT ST and SEMINARY SQUARE (the park on the southwest area of this intersection is the first location of Indiana University, from 1820-1884); turn right (north); proceed to
A5	2.5 2.5 (0.4)	MONROE COUNTY COURTHOUSE (on left just past Kirkwood Ave): The third courthouse, built in 1908 of Salem limestone with bearing-wall construction (i.e. the walls hold the weight of the structure); includes several stone carvings on the building and the grounds (cf. APPENDIX II), including --"Light of the World" over south entrance by Albert Molnar, a Hungarian emigrant; --The Grand Army of the Republic Monument (1928) (on southeast corner of the Square), designed by George W. Bunting and carved by Henry McIlween and Joseph Graf, a stone carver from the Black Forest area of Germany; --"The Fighting Yank" (on the northeast corner of the Square) (unk. date; post WWII) carved by Harry Donato; --limestone slab (east side of walk leading to front entrance of Courthouse) which marked the center of U. S. population in 1910 (and was moved here from in front of the Showers Furniture Factory). --Vietnam Memorial (west side of Square) (1991), carved by Tony Grubb, a locally-born independent stone carver. Continue north on Walnut to
A6	2.8 2.8 (0.3)	BUSKIRK-SHOWERS HOUSE (Porticos, just south of 10th St) (c. 1900): Built by P. K. Buskirk, son of pioneer settlers of Monroe County; bought and interior remodeled in 1927 by Wm. E. Showers: declared "the most beautiful house in Bloomington" in 1914. Continue north on Walnut to
A7	3.4 3.4 (0.6)	MILLER-SHOWERS PARK in which is located two limestone sculptures including "Red, Black, Blonde and Olive" (1980), a sculpture designed by IU faculty artist, Jean Paul Darrlau, and carved by Harold "Dugan" Elgar (who had a bit part in "Breaking Away"; he also carved his own tombstone in white marble (1968, located in Clear Creek Cemetery; where he was buried in 1984)). Continue north on Walnut to
	3.9 3.9 (0.5)	SR 45/46 (BYPASS); turn left (west); continue to just past the entrance to the Super 8 Motel (on right); pull over.

A8	4.6 (0.7)	4.6	REED QUARRIES is on the right; an old quarry which continues to survive today as an ongoing concern--a father/son operation. Continue west.

(IF OPTION B IS SELECTED, CONTINUE WITH THE FOLLOWING DIRECTIONS: IF NOT, SKIP TO JUST PAST NEXT DASHED LINE).

	--	4.7 (0.1)	Take SR 37/46 BYPASS to the north (right) for about 1/4 mi; turn left (to Ellettsville/Spencer); follow curve to right; at traffic light, turn left (west) onto SR46. Continue west to
	--	5.9 (1.9)	MAPLE GROVE ROAD; turn right. Sitting in front of first house on the left is the
B1	--	6.0 (0.1)	SOLSTICE STONE (1987) (V. J. Shiner, Jr. Residence) by contemporary Bloomington artist and stone carver David Rodgers; this sculpture has two holes through it which cast oval sunbeams onto two bluestone ovals of the same dimensions laid in the horizontal concrete base below the stone: one bluestone is illuminated at the Winter Solstice (on or about December 22), the other at Summer Solstice (on or about June 21). Proceed north on Maple Grove Rd to next house on left, which is the
B2	--	6.1 (0.1)	STOUT HOUSE (1828) (3655 N. Maple Grove Rd). This is the FIRST HOUSE BUILT ENTIRELY OF SALEM LIMESTONE and is OLDEST STANDING HOUSE IN MONROE COUNTY; it was erected by Daniel Stout on land granted to him by President James Monroe (!) in 1818 for his service to Governor William Henry Harrison during the War of 1812; it was built of limestone cut by hand from the ledges exposed in nearby Stout Creek; the solid walls are 24 inches thick. Continue north on Maple Grove Rd.
B3	--	6.9+ (0.8)	STONE FENCES (c. 1870); known to masons as "dry wall", these fences are built without mortar, and were most likely erected by itinerant German stone masons; often their foundations are dug to below the frost line (about 2 feet below the surface). A number of these remain around the county in various states of repair. Continue north on Maple Grove Rd. to
B4	--	8.8 (0.9)	MAPLE GROVE CHURCH & CEMETERY (Note the limestone "tree trunk" gravestones which were most popular between 1890 and 1910). Continue east, then north on Maple Grove Rd; note limestone posts used for property markers and corner fence posts; continue to 4-way stop at

	--	9.7 (0.9)	MAPLE GROVE RD W; turn left (west). Watch mileage. Continue west, past Union Valley Rd (about 2.8 mi from Maple Grove Rd N/W intersection) to
B5	--	12.5 (2.8)	MATTHEWS MANSION (1869) (last house on left before Mt. Tabor Rd); built by John Matthews, a stone-carver who had come to the area with his family from Sussex, England in 1849; while in England he had gained experience as a stone mason working on the British Houses of Parliament; once established, he opened and built up his own quarrying and milling business--the Matthews Stone Company--which continued in the family until 1969 when it was sold to Wilbur Bybee and became the Bybee Stone Company--however the company office buildings he built still remain (see B6). Continue to
	--	12.6 (0.1)	MT. TABOR ROAD; turn left (south). Continue south across creek (Jack's Defeat Creek) and railroad track (Monon); all buildings on the immediate right are the property of
B6	--	12.8 (0.2)	BYBEE STONE COMPANY (prior to 1969, the Matthews Stone Company). Both quarrying and milling takes place here; carving for both new construction and restoration is the company's forte (see VCR tape in BIBLIOGRAPHY). Continue south on Mt. Tabor Rd (note that it becomes Matthews Dr) to
	--	13.4 (0.6)	TEMPERANCE ST (SR 46); turn left (east). Continue east, out of Ellettsville to traffic light at
	--	15.7 (2.3)	UNION VALLEY RD (note large stone on left; look back on it as you pass it to see "Welcome to Ellettsville: Builders of American History". Is this a spurious claim?). Continue past Maple Grove Rd to traffic light; turn right; continue around curve to yield sign; turn right, onto
	--	18.5 (2.8)	SR 37 BYPASS; continue south to
	--	18.8	FIRST TRAFFIC LIGHT (NOTE: THIS IS WHERE OPTION A and OPTION B coincide again (only mileages differ).

(IF OPTION A WAS SELECTED, CONTINUE WITH THE FOLLOWING DIRECTIONS DIRECTLY FROM THOSE JUST BEFORE THE FIRST DASHED LINE ABOVE).

(OPTION A ONLY: Continue west on SR 45 BYPASS to the traffic light.) Turn left (south) onto

4.8 (0.2)	18.8 --	SR 37 (BYPASS); immediately on the right (west) of the road is

A9 4.9 18.9 (0.1) STAR QUARRY; an area which is being quarried extensively again after being closed through the 1970's (includes Bennett Quarry which was closed by the Environmental Protection Agency due to PCB contamination and was a favorite swimming hole because of its accessibility). Continue south on SR 37 Bypass through next 4 traffic lights to

11.3 25.3 (6.4) VICTOR PIKE; turn left (northwest). Immediately on the right is an old

A10 11.4 25.4 (0.1) STONE FENCE (cf. B3) (1887); 104 years ago a man and a boy hauled stone from nearby quarries by horse and sled and built 2 rods of fence per day for $2.50 per rod. (How long is a rod? How many feet of fence did they build in a day? Accounting for inflation, would you work for such wages? (To determine this find the inflation FACTOR in APPENDIX I--How much did they make in a day? Would you do this kind of work for that wage?). Continue northwest to first road to right; turn onto

11.5 25.5 (0.1) CHURCH LANE (CLEAR CREEK ROAD); continue to old railroad bed

11.8 25.8 (0.3) BLOOMINGTON SOUTHERN RAILWAY--opened June 30, 1914, running from Bloomington 8.83 mi southwest to the Victor Oolitic Stone Company (which is still in operation)--has been bought by the Bloomington Parks Department and is being opened this year as a recreational path (walking, jogging, cycling). Continue east to stop sign (deadend). Immediately across the street is

12.0 26.0 (0.2) CLEAR CREEK CEMETERY in which Harold "Dugan" Elgar is buried (also a double tree-trunk grave stone and other gravestones of interest). Turn left, then right immediately past Clear Creek Christian Church back onto CHURCH LANE (CLEAR CREEK RD). (To get to Elgar's grave: Take second lane on the right into cemetery; go over the hill). Continue east on CHURCH LANE to flashing red light on

12.5 26.0 (0.5) (OLD) SR 37; watch mileage; continue straight through intersection; Church Lane becomes Fairfax Rd; continue east then turn south; 2.1 mi from SR 37, watch on right for

14.6 28.6 (2.1) SANDERS SCHOOL (now occupied by a private company).

A11 "LONG HOLE" of "Breaking Away" fame is 1/2 mi directly west from the parking lot of the school. (For an excursion, walk along

	14.7 28.7 (0.1)	ABANDONED RAILROAD BED just south of school--park in town of
	14.8 28.8 (0.1)	SANDERS--BE SURE TO OBTAIN PERMISSION FROM INDIANA LIMESTONE COMPANY (1-812-275-3341: Mr. Tucker, President and CEO). Continue south on Fairfax Rd towards Smithville; at Sunoco Gas Station and Food Mart at
	15.5 29.5 (0.7)	McCORMICK LANE, turn right; continue to deadend at
	15.8 29.8 (0.3)	SMITHVILLE ROAD; turn right; continue to
	17.3 31.3 (1.5)	SR 37 (four-lane); turn left (south). Continue to flashing orange light (very large, tall Stonehenge Restaurant sign on right) at
	24.5 38.5 (7.2)	OLD SR 37 (to Guthrie); turn left (southeast); continue through Needmore on SR 37 until it deadends (see map enlargement of area on p. 16); turn left onto
	28.5 42.5 (4.0)	GRAVEL ROAD (400 N) which leads to
	28.6 42.6 (0.1)	HOPKINS CEMETERY; walk to south side and look into
A12		EMPIRE STATE BUILDING QUARRY hole (the quarry from which came all the stone facing for the Empire State Building (1931)). The best view is from the west, but again PERMISSION IS NEEDED from the Indiana Limestone Company which owns the land on which this quarry is located. Turn around; follow SR 37 to the
	29.1 43.1 (0.5)	"Y" AT EVANS BODY SHOP AND GAS STATION: follow 475 North Rd to the left; to the next
	29.4 43.4 (0.3)	"Y"; veer left; continue through two 90 degree turns (which leads it into Troyden Lane/475 N) back to
	30.4 44.4 (1.0)	(NEW) SR 37 (FOUR-LANE); turn left (south); continue to traffic light at Oolitic exit; note (on the left)
	32.6 46.6 (2.2)	THE PAIR OF EAGLE HEADS marking the entrance to the Indiana Limestone Company's Joyner Mill and P. M. & B. Quarries--Indiana Limestone Company is the largest producer of Indiana dimension limestone and the largest U. S. producer of dimension limestone period). Continue south on SR 37 through traffic light at SR 58 East to traffic light at

	35.7 49.7 (3.1)	SR 158 & 450 W; watch mileage turn right (west): continue past two churches (one on the right; one on the left with its cemetery); at 3.2 mi watch for 90 degree turn to the right (west), continue straight into the entrance and gravel parking lot of
A13	38.9 52.9 (3.2)	ELLIOTT SPECIAL PRODUCTS (EUREKA QUARRY): tours of active limestone quarrying are available for the general public from spring through fall on Saturdays at 10:00 am (and for tour groups, by appointment on any weekday) for $2.50 per person; a guide is provided. Contact Ms. Robin Elliot, Elliot Special Products, Inc., P. O. Box 1267, Bedford, IN 47421, PH. 1-812-275-1900; FAX No. 812-275-7068. (NOTE: IF YOU DO NOT HAVE YOUR MSHA RELEASE FORM SIGNED AND TURNED IN YET, PLEASE DO SO AT THIS TIME.) AFTER TOUR; return by SR 158 to
	42.1 56.1 (3.2)	SR 37; turn left; continue to Bloomington; pass through a traffic light and a flashing orange light; continue just past That Rd to
	61.3 75.3 (22.4)	ROCKPORT RD; turn right (northeast); note quarries and mills along this road; continue through 4-way stop to deadend at
	63.9 77.9 (2.6)	ROGERS ST; turn left; continue to THIRD traffic light at
	65.3 79.3 (1.4)	FIFTH ST; turn right (east); at Walnut (just east of Square, street becomes KIRKWOOD); continue to deadend in front of IU Sample Gates (1987) straight ahead at
	66.0 80.0 (0.4)	INDIANA AVE; turn left; proceed to 4-way stop; turn right onto
	66.1 80.1 (0.1)	7TH STREET; proceed through next 4-way stop to gate in front of
END	66.3 80.3 (0.1)	INDIANA MEMORIAL UNION.

PART IV

GLOSSARY OF BUILDING STONE AND MASONRY TERMS

(abridged and adapted from Patton, 1974)

ASHLAR. A catchall term for squared stone masonry units, or for walling constructed of them.

BALUSTER. A small column, generally turned, that supports the rail of a BALUSTRADE.

BALUSTRADE. Ornamental fencing consisting of a series of BALUSTERS supporting a handrail or molding.

BLOCK. In quarrying, the large piece of stone, generally squared, that is taken from the quarry to the mill for sawing, slabbing, and further fabrication.

BOND. In masonry, the arrangement of stone units or brick to provide strength, stability, and/or beauty.

CALCITE. A mineral form of calcium carbonate. Principal constituent of most LIMESTONES.

CAPTIAL. Intermediate member between shaft of a column or pier and beam, arch, or vault, usually ornamented by molding or carving or both.

CARVED WORK. In stonework, hand cutting of ornamental features for which the lines cannot be applied from pattern.

CARVER. In stone industry, the artisan who does CARVED WORK.

CHAT-SAWED FINISH. In stone fabrication, the moderately rough surface resulting from using chat (crushed chert) as the abrasive agent carried by the GANGSAW blades.

COPING. A protective covering capping a wall.

COQUINA. Coarse porous limestone composed of shells and shell fragments loosely cemented by CALCITE.

CROWFOOT. Colloquial term for STYLOLITE.

CUT STONE. Building stone cut to specified size and shape, each piece fabricated to conform to drawings and to be installed in a designated location in the finished structure.

DIMENSION STONE. Stone that is selected, trimmed, or cut to desired shapes and (or) sizes for such uses as building stone, markers, paving blocks or FLAGGING, curbing, cut or carved ornaments and novelties, furniture, and industrial applications.

DRY WALL. In masonry construction, a self-supporting rubble or ashlar wall laid up without mortar.

FLAGGING. 1. Collective term for FLAGSTONES. 2. A surface paved with FLAGSTONES. 3. The process of setting FLAGSTONES.

FLAGSTONE. A flat stone, thin in relation to its surface area, that may be used as a steppingstone or for terrace or floor paving. May be split or sawn, or may occur naturally in thin beds.

FREESTONE. Stone which has no tendency to split in any preferential direction and is thus eminently suited for carving and elaborate milling. Usually fine-grained and easily worked. Most freestones are sandstones or granular LIMESTONES.

GANGSAW. In fabricating dimension stone, an assemblage of parallel reciprocating saw blades to cut quarry blocks into slabs, generally effecting the cutting by use of a loose abrasive material, such as sand, chat, or silicon carbide, together with water, or by use of diamond or tungsten blade inserts.

GROUT PILE. Colloquial term for stacked or piled quarried stone that cannot be further processed economically.

HEWN STONE. Stone shapped with mallet and chisel.

KEY BLOCK. In deepening a quarry, or starting to quarry downward from a horizontal surface, the first block removed from a new ledge, providing space and access for further block removal by undercutting, underdrilling, or lateral shifting.

KEYSTONE. Wedge-shaped stone at the center or summit of an arch or vault, binding the structure actually or symbolically.

LAPIES. The rough surface of bedrock form beneath soil by differential solution of a soluble rock. Large, irregular masses are often used as decorative settings in gardens.

LIMESTONE. Rock of sedimentary origin composed principally of CALCITE or dolomite or both.

LINTEL. Horizontal member that bridges a door or window opening.

MILLING. In the stone industries, comprehensive term for processing of quarry blocks through sawing, planing, turning, and cutting techniques to yield finished stone.

MOLDING. In cut stone, the linear, continuous, decorative motif that is cut or carved on or into strips, billets, or blocks of stone.

MONOLITHIC. Shaped from a single block of stone, as a monolithic column, in contrast with a stacked column consisting of superimposed stone drums.

OOLITE. 1. A spherical grain less than 2 mm in diameter, that is most commonly composed of calcite and that consists of concentric shells. 2. A rock, generally limestone, composed largely of these spherical grains.

RANDOM ASHLAR. Stone masonry pattern of rectangular stones set without continuous joints and laid up without drawn patterns.

RUSTICATED. Cut stone walling with strongly emphasized recessed joints and smooth or roughly textured block faces. Used to create an appearance of impregnability.

SCABBLE. To dress stone to a rough planar face with a pick, hammer, or chisel, leaving prominent toolmarks.

SHOT-SAWED FINISH. In stone fabrication, the randomly scored surface resulting from chilled steel shot carried by the GANGSAW blades.

STONE. Rock selected or processed by shaping, cutting or sizing for building or other use.

STYLOLITE. A boundary in limestone or marble marking a bedding plane or joint which forms a rough contact surface when separated. Often considered a defect because it may be a zone of weakness. But may be considered beautiful, and therefore marketable, because of this "veining."

TOOLED FINISH. In stonework, a fluted, flat surface that carries 2 to 12 grooves (batts) per inch.

TRIM. Stone used as decorative members on a structure built or faced largely with other masonry material.

TURNED WORK. Pieces with circular cross-section, such as columns or balusters, which are generally cut on a lathe.

VUG. A pocketlike natural cavity in stone, generally the result of solution or recrystallization.

WIRE SAW. An assembly for sawing stone, both in the quarry and in the mill, by a rapidly moving continuous wire, under tension and commonly helical, that carries a slurry of sand or other abrasive material through a slot that is deepened in the process.

SOURCE: John B. Patton. 1974. Glossary of Building Stone and Masonry Terms, Indiana Geological Survey Occasional Paper 6, Bloomington, Indiana

PART V

RESOURCE MATERIALS

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*For meaning of abbreviations in parentheses after each entry see end of BIBLIOGRAPY.

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ILI--Indiana Limestone Institute of America, INC., Suite 400, Stone City Bank Building, Bedford, IN 47421 (Bill McDonald, Executive Director, 812-275-4426).

IUB:GEOL--Geology Library, Indiana University--Bloomington, 10th Street, 812-855-7170.

IUB:RD--Main Library, Research Collection (to the right from main entrance on first floor), Indiana University--Bloomington, 10th & Jordan, 812-855-0100.

IUB:UG--Main Library, Undergraduate Collection (to the left from main entrance on first floor), Indiana University--Bloomington, 10th & Jordan, 812-855-0100.

MCPL--Monroe County Public Library, Kirkwood & Lincoln (about 3 or 4 blocks west of Sample Gate i.e. main IU campus entrance on Indiana Avenue), 812-339-2271.

VIDEO CASSETTES

Bybee Stone Company--Promotional (14:32 min) (Bybee Stone Company, P. O. Box 968, Bloomington, IN 47402; PH. 1-800-457-4530; FAX 812-876-6329; MAY be able to obtain a single copy without charge). Shows many of the milling operations, stone carving, and some buildings where their stone has been used. Quite good despite its promotional nature.

"Limestone Pieces" (17:31 min) (Bloomington Community Access Television, 303 E. Kirkwood Ave, Bloomington, IN 47408; PH. 812-323-4353; a copy may be obtained by providing BCAT with TWO good quality VCR tapes--one will be used to make a recording for you; the other is your donation for the service). Shows several scenes related to Indiana limestone including quarries, stone carvers/carving, buildings, and tree-trunk tombstones. Except for relative inaudibility on early part of the narration, this tape provides several brief highlights of the limestone industry.

"That Astonishing Material" (4:18 min) (Indiana Limestone Institute of America, Inc., Stone City Bank Building, Bedford, IN 47421; PH 812-275-4426; $50, but MAY be rented at no cost). Very brief and highly promotional. Still it has several short scenes of quarrying, milling,carving, and buildings of Indiana limestone.

AUDIO TAPE

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APPENDIX I

DIMENSION LIMESTONE PRODUCTION IN INDIANA AND THE UNITED STATES*

		U. S.				INDIANA				
YEAR	FACTOR	VOLUME	WEIGHT	VALUE	1991 VALUE	VOLUME	WEIGHT	VALUE	1991 VALUE	PERCENT
1988	1.1	4.1	347	38.1	41.7	2.3	195	24.9	27.2	56.2
1987	1.2	4.0	332	35.9	42.1	2.2	184	23.1	27.1	55.4
1986	1.2	3.6	303	33.2	41.5	2.1	174	21.2	26.5	57.4
1985	1.3	3.3	281	34.3	45.6	2.0	169	20.2	26.8	60.1
1984	1.4	3.4	283	31.3	44.0	1.9	163	17.1	24.0	57.6
1983	1.5	2.9	245	19.1	28.4	1.7	145	11.0	16.3	59.2
1982	1.6	2.6	215	19.2	30.0	1.5	127	11.6	18.1	59.1
1981	1.7	3.3	280	22.0	37.8	1.7	145	13.7	23.5	51.8
1980	1.9	3.5	295	21.3	39.9	1.9	158			53.6
1979	2.0	5.6	470	25.8	52.4	4.0	338			71.9
1978	2.2	4.4	370	20.0	43.8	2.7	230			62.2
1977	2.3	5.3	443	18.8	44.1	2.9	240	11.6	27.2	54.2
1976	2.5	4.9	414	19.8	49.5	3.1	259			62.6
1975	2.7	5.0	420	18.3	48.6					
1974	2.8	6.2	517	18.2	50.0	2.9	241	9.3	25.6	46.6
1973	2.9	4.4	370	11.9	34.4	2.6	217	6.8	19.7	58.6
1972	3.0	4.9	411	14.4	43.9	3.1	257	9.5	28.9	62.5
1971	3.2	5.6	468	15.1	48.1	3.6	300	9.8	31.2	64.1
1970	3.3	5.7	482	14.9	49.8	3.3	273	9.4	31.4	56.6
1969	3.5	6.8	574	17.3	60.3	4.3	357	11.3	39.4	62.2
1968	3.6	7.2	602	16.3	59.1	7.2	388	10.4	37.7	64.5
1967	3.8	6.7	561	16.6	62.5	4.2	349	10.8	40.7	62.2
1966	3.9	8.7	728	18.3	71.5	5.2	440	11.7	45.7	60.4
1965	4.1	8.7	732	17.1	69.5	5.4	456	11.0	44.7	62.3
1964	4.2	9.3	779	18.9	79.7	6.4	534	12.2	51.5	68.5
1963	4.4	10.7	895	18.1	79.2	7.0	584	10.7	46.8	65.3
1962	4.5	10.7	896	16.8	76.1	6.8	568	11.3	51.2	63.4
1961	4.7	10.2	855	16.7	78.3	6.4	536	11.0	51.6	62.7
1960	4.8	10.2	860	17.1	82.8	6.3	529	11.5	55.7	61.5
1959	5.0	11.3	952	20.7	102.5	7.0	587	14.4	71.3	61.7
1958	5.1	11.7	979	18.8	95.5	6.6	558	12.9	65.5	57.0
1957	5.2	13.5	1,132	21.3	110.8	7.1	595	15.2	79.1	52.6
1956	5.3	12.3	1,029	20.7	110.0	6.8	570	14.4	76.5	55.4
1955	5.5	14.1	1,182	24.6	134.5	8.2	692	18.5	101.2	58.5
1954	5.6	14.0	1,174	19.9	111.0	7.3	613	14.8	82.6	52.2
1953	5.7	9.5	799	15.5	88.4	5.5	461	11.0	62.7	57.7
1952	5.8	9.4	787	15.1	88.0	5.4	451	10.7	62.4	57.3
1951	6.0	9.6	807	18.3	109.2	5.8	486	13.5	80.6	60.2
1950	6.1	9.6	806	17.8	108.5	5.8	485	12.7	77.4	60.2
1949	6.2	8.1	680	12.7	78.8	4.5	375	7.9	49.0	55.1
1948	6.3	7.2	607	10.6	67.2	4.4	366	7.4	46.9	60.3
1947	6.5	6.5	543	7.2	46.7	3.6	306	4.9	31.8	56.4
1946	6.6	6.0	505	5.9	38.9	3.2	271	4.0	26.4	53.7
1945	6.7	4.0	334	2.5	16.8	1.8	155	2.0	13.4	46.4

(continued)

APPENDIX I (Continued)

		U. S.				INDIANA				
YEAR	FACTOR	VOLUME	WEIGHT	VALUE	1991 VALUE	VOLUME	WEIGHT	VALUE	1991 VALUE	PERCENT
1944	6.9	1.9	162	0.6	4.1	0.6	51	0.4	2.8	31.5
1943	7.0	2.8	237	0.8	5.6	0.8	68	0.4	2.8	28.7
1942	7.1	5.5	463	2.1	14.9	1.4	116	1.3	9.2	25.1
1941	7.2									
1940	7.4	12.9	1082	4.3	31.6	3.0	248	2.1	15.5	22.9
1939	7.5	12.6	1061	6.7	50.2	5.1	432	4.1	30.7	40.7
1938	7.6	8.4	704	4.9	37.3	3.6	304	3.2	24.4	43.2
1937	7.8	8.5	714	5.3	41.1	4.0	332	3.5	27.1	46.5
1936	7.9	9.6	805	4.9	38.5	4.3	364	3.2	25.2	45.2
1935	8.0	8.6	723	3.0	23.9	4.4	367	1.9	15.1	50.8
1934	8.1	7.0	586			4.6	387	2.8	22.8	66.0
1933	8.2	6.6	551	6.5	53.6	4.9	411	4.8	39.6	74.7
1932	8.4	6.8	571	6.5	54.4	5.9	495	5.5	46.1	86.8
1931	8.5	9.0	756	10.5	89.4	7.9	663	8.6	73.2	87.8
1930	8.6	14.1	1,184			12.3	1,033	15.3	131.5	87.2
1929	8.9	15.6	1,310			14.0	1,176	17.4	155.0	89.7
1928	9.2	15.9	1,335			14.5	1,218	18.0	165.9	91.2
1927	9.5	14.8	1,243			13.6	1,142	16.4	156.3	91.9
1926	9.8	15.2	1,276			14.2	1,192	18.1	178.2	93.4
1925	10.1	12.8	1,075			11.8	991	14.2	143.6	92.2
1924	10.4	11.7	982			11.0	924	14.2	147.5	94.0
1923	10.7	12.2	1024			11.7	982	15.2	162.0	95.9
1922	10.9	10.2	856	12.7	138.9	9.6	808	11.3	123.6	94.4
1921	11.2	8.0	673	7.9	88.9	5.3	445	6.8	76.5	66.1
1920	11.6	7.3	613			6.2	521	5.4		
1919	11.8					6.4	537	7.2		
1918	12.1			2.3	27.9	2.7	227	1.8		
1917	12.4	8.5	712	4.1	50.9	6.8	571	3.3	41.0	80.2
1916	12.7			4.6	58.4	8.6	718	3.5	44.4	76.1 VB
1915	13.0			4.1	53.2	8.7	730	2.9	37.6	70.7 VB
1914	13.3			3.9	51.8	7.9	666	2.2	29.2	56.4 VB
1913	13.6			4.5	61.2	9.0	757	3.1	42.1	68.9 VB
1912	13.9			5.1	70.9	10.4	877	3.4	47.3	66.7 VB
1911	14.2			4.7	66.6	9.5	800	3.0	42.5	63.8 VB
1910	14.5			5.3	76.6	9.7	818	3.2	46.2	60.4 VB
1909	14.7			4.8	70.6	9.4	790	2.5	36.8	52.1 VB
1908	15.0			4.6	69.1	8.3	701	2.4	36.1	52.2 VB
1907	15.3			4.6	70.4	7.5	629	2.3	35.2	50.0 VB
1906	15.6			5.1	79.7	9.3	779	2.6	40.6	51.0 VB
1905	15.9			5.3	84.5	8.5	711	2.4	38.2	45.3 VB
1904	16.2			4.6	74.4	6.8	572	1.6	25.9	34.8 VB
1903	16.5			5.0	82.3	6.5	547	1.6	26.4	32.0 VB
1902	16.8			5.6	93.8	6.8	568	1.6	26.8	28.6 VB
1901	17.0			5.2	88.6	7.0	591	1.8	30.7	34.6 VB
1900	17.4			4.3	74.6	7.0	591	1.6	27.8	37.2 VB
1899	17.1			5.2	89.0	7.1	599	1.4	24.0	26.9 VB

(continued)

APPENDIX I (Continued)

		U. S.			INDIANA			
YEAR	FACTOR	VOLUME	WEIGHT	VALUE	1991 VALUE	VOLUME	WEIGHT	VALUE	1991 VALUE	PERCENT
1898	17.9					5.6	473	1.4	25.0	
1897	18.2					5.4	452	1.3	23.7	
1896	18.5					5.5	459	1.2	22.2	
1895	18.8					5.4	451			
1894	19.0					4.6	385			
1893	19.3									
1892	19.7					3.8	320			
1891	20.0									
1890	20.2									
1889	20.5									
1888	20.8									
1887	21.1					2.4	198			
1886	21.4									
1885	21.7					0.9	73			
1884	22.0					1.0	82			
1883	22.3					0.6	50			
1882	22.7					0.7	55			
1881	23.0					0.7	61			
1880	23.3					0.5	44			
1879	23.6					0.4	37			
1878	23.9					0.4	35			
1877	24.2					0.3	29			
	TOTAL					564.4	47,178			

*FACTOR (rough figure by which VALUE may be multiplied to yield an equivalent value in 1991 dollars (1991 VALUE); it has been extrapolated back to 1877 from 1900, and extended to 1991 from 1982 based on an estimated 4% average annual inflation rate over that period; some interpolation was necessary as well for missing years)
VOLUME (millions of cubic feet)
WEIGHT (thousands of short tons)
VALUE (millions of dollars)
VB (VALUE-based proportion; otherwise determined on VOLUME)
PERCENT (proportion of total U. S. production accounted for by Indiana production)

SOURCES: Batchelor, 1944; U. S. Bureau of Mines, Minerals Yearbook, 1883-1988; U. S. News and World Report, February 21, 1983, Volume 94, p. 86.

APPENDIX II: CHRONOLOCGICAL HISTORY

1810 First white families settle in "oolitic" (i.e. Salem lime-) stone belt (1, p. 7).

1816 Indiana joins Union (4, p. viii).

1818 Bloomington and Monroe County established, and the First Monroe County Courthouse--a log house--was erected (2, p. xiv: 3, p. 1).

1820 Indiana Seminary (later "College" (1829), then "University" (by 1848)) was established (3, p. 1: 4, p. viii).

1826 FIRST RECORDED USE OF CUT (Indiana lime-) STONE for the foundation and sills of the mainly brick Second Monroe County Courthouse (2, p. xvi; 3, pp. 1, 8).

1827 FIRST COMMERCIAL QUARRY opened by Richard Gilbert 3/4 mi south of Stinesville, Monroe County (1, p.8).

1828 FIRST HOUSE BUILT OF INDIANA LIMESTONE and OLDEST STANDING HOUSE IN MONROE COUNTY. The Stout House (3655 N. Maple Grove Rd (the latter located less than a mile west of Bypass SR 37 on West SR 46, northwest of Bloomington) was erected by Daniel Stout on land granted to him by President James Monroe (!) in 1818 for his service to Governor William Henry Harrison. Built of limestone cut by hand from the ledges exposed in nearby Stout Creek, the solid walls are 24 inches thick (2, p. 32).

1832 FIRST STONE CARVER arrives in area; a man named Toburn brought to Bedford from Louisville by Dr. Winthrope Foote, a pioneer physician, to carve the Foote family burial vault (1, p. 8).

1835 WYLIE HOUSE (307 E. Second) built of brick on an Indiana Limestone foundation was constructed by Andrew Wylie, first president of Indiana University (3, pp. 2-3).

1837 Ellettsville founded (4, p. ix).

1838 Publication of David Dale Owen's (son of Robert Owen of New Harmony fame) report "A Geological Reconnaissance of the State of Indiana," which gave WIDER PUBLICITY TO THE INDIANA STONE DISTRICT (1, p. 8).

1852 FIRST BEDFORD (Lawrence County) QUARRY opened by John Glover, 1/2 mi south of Bedford (1, p. 8)

1853-54 FIRST TRAIN OF MONON (New Albany and Salem, at that time) RAILROAD reaches
--Bedford, April 18, 1853
--Bloomington, December 14, 1853
--Ellettsville, January 1854
and OPENS LOUISVILLE AND CHICAGO (that is northern and southern) MARKETS (1, p. 9).

1853 Opening of WATTS-BIDDLE QUARRY at Stinesville, Monroe County (1, p. 10).

Work on FIRST MAJOR BUILDING CONSTRUCTED OF INDIANA LIMESTONE--United States Custom House and Courthouse in Louisville, Kentucky--begun (1, p. 14).

till 1855 ALL WORK DONE BY HAND AND HORSE: pick and shovel; wheelbarrow; horse-drawn dumpcart; 10-20 feet long hand-drills to drill as many as 10-12 aligned 3-4 inch holes for black powder charges blasted simultaneously to loosen a large rock ledge; broken into blocks using hand-drills, tap hammers, and wedges; slabs sawn by 10-12 feet long 2-man crosscut saws; lifting of blocks up to 80 cubic feet done by wooden derricks and booms; steel guy rods or manilla guy ropes; and hoisting by hand- or horse-power (1, p. 12)

1855 FIRST STEAM-DRIVEN GANG SAW installed in Indiana stone district at Watts-Biddle quarry (1, p. 13).

1855-57 SECOND RAILROAD (the Baltimore and Ohio, then called the Ohio and Mississippi) constructed through southern Lawrence County crossing the Monon at Mitchell and OPENING EASTERN AND WESTERN MARKETS (1, p. 9).

1862 FIRST ELLETTSVILLE QUARRY opened by John Matthews (now part of Bybee Stone Company property) (1, p. 10).

1868 FIRST SPENCER (Owen County, IN) QUARRY opened (Gosport Stone and Lime Company) (1, p. 10).

INDIANA GEOLOGICAL SURVEY (Indiana Geology Department) ESTABLISHED--PROMOTED USE OF INDIANA LIMESTONE FOR BUILDING PURPOSES (1, p. 27).

1869 MATTHEWS MANSION (Maple Grove Rd at Mt. Tabor Rd, north of Ellettsville) built by John Matthews, a stone-carver who had come to the area with his family from Sussex, England in 1849 (4, pp. 21-22).

1870 THIRD RAILROAD (today called the Penn Central) was constructed, connecting Gosport (Owen County) to Indianapolis and Vincennes (1, p. 9).

NUMBER OF QUARRIES: 16 (1, p. 34).

1871 LAWRENCE COUNTY COURTHOUSE CONSTRUCTED of Indiana Limestone in Bedford, dedicated on July 4, and ATTENDED BY CHICAGO STONE CONTRACTOR JOHN RAWLE WHO BECAME AN AVID PROMOTER OF THE USE OF INDIANA LIMESTONE (1, p. 24).

1871-72 MAJOR IMPETUS FOR THE USE OF INDIANA LIMESTONE in the rebuilding, following the major fires, of Chicago (1871) and Boston (1872) since limestone buildings were observed to suffer least from fire damage (1, p. 24).

1872 FIRST TRAVELLING CRANE--a steam-powered one--used to move stone around in mill operations was introduced by Perry Brothers of Ellettsville (1, p. 44).

1873 A Bedford quarry supplied the "BLUE" SALEM LIMESTONE USED FOR PILASTERS AND CAPITALS OF ILLINOIS STATEHOUSE AT SPRINGFIELD (1, p. 25).

1875 FIRST STEAM-DRIVEN CHANNELING MACHINE (used to drive chisels and separate blocks of rock) introduced into the area by John Matthews (1, pp. 39-40).

1875-76 Opening of BEDFORD TO BLOOMFIELD RAILROAD

1876 PRONOUNCEMENT BY an inspector from THE OFFICE OF THE SUPERINTENDENT OF PUBLIC BUILDINGS OF THE UNITED STATES THAT INDIANA LIMESTONE WAS SUPERIOR TO ANY OTHER IN THE COUNTRY FOR BUILDING PURPOSES (1, p. 26).

1877 Opening of competition for stone contracts for the BUILDING OF CHICAGO CITY HALL and the INDIANA STATEHOUSE, which resulted in MAJOR USE OF INDIANA LIMESTONE for their construction (1, pp. 28-29).

FIRST YEAR FOR WHICH PRODUCTION STATISTICS ARE AVAILABLE: 339,153 cu ft produced in Indiana Stone District (1, p. 14).

1877-81 MAJOR EARLY MARKETS: ILLINOIS--55%; INDIANAPOLIS--19%; KENTUCKY--11%; OTHER INDIANA--6%; OTHER U. S.--9% (1, p.30).

1879 FIRST TRAIN CARLOAD OF INDIANA LIMESTONE SHIPPED TO NEW YORK CITY (April 12) and 25 CARLOADS SHIPPED THERE LATER IN THE YEAR TO BUILD THE FIFTH AVENUE RESIDENCE OF WILLIAM K. VANDERBILT DSEIGNED BY ARCHITECT RICHARD M. HUNT (1, p. 29).

1881 EMPLOYMENT/PRODUCTIVITY FIGURES: 604 men worked 1,978,704 hours to produce 718,575 cu ft of stone, or 0.363 cu ft/man-hour, or 1,190 cu ft/man (1, p. 55).

1882 FIRST FOREIGN-BORN MEN BROUGHT IN TO WORK IN STONE DISTRICT: 20 Italians by David Reed (1, p. 56).

1884 Indiana University moved to Dunn's Woods (present) location after fire at Seminary Square (old) location at Second and College; the first 2 buildings, OWEN HALL AND WYLIE HALL, ARE MAINLY BRICK WITH INDIANA LIMESTONE FOR SILLS, STEPS, AND SOME TRIM (5, p. 2).

1885 AUTOMATIC FEEDING OF SAND AND WATER TO GANGSAWS IN MILLING OPERATIONS INCREASED PRODUCTIVITY SIGNIFICANTLY (1, p. 43).

NUMBER OF QUARRIES: 21 (1, p. 34).

1886 MAJOR MARKETS: Chicago, Cincinnati, and Philadelphia (1, p. 32).

1886 FIRST MAJOR JOB FOR WHICH CUT STONE WAS SHIPPED FROM THE INDIANA STONE BELT READY TO SET IN THE WALL--Cotton Exchange Building in New Orleans (i.e. the START OF STONE FINISHING IN THE BELT) (1, p. 45).

1889-91 MAJOR MARKETS: Chicago and New York (1, p. 32).

1889-97 RAILROAD CONNECTING BEDFORD TO EVANSVILLE AND RICHMOND, IN CONSTRUCTED (1, p. 35).

1890 By this time, WIRE CABLE HAD REPLACED MOST ROPE for hoisting stone in quarrying operations (1, p. 42).

NUMBER OF QUARRIES: 40 (1, p. 34).

1890-95 "BILTMORE HOUSE" DESIGNED AND BUILT BY RICHARD M. HUNT FOR GEORGE W. VANDERBILT AT ASHEVILLE, NORTH CAROLINA; described at the time as "by far the most sumptuous home built in the last quarter century" (1, p. 29).

1890-1910 Period of greatest POPULARITY OF "TREE TRUNK" TOMBSTONES (2, p. xxvii).

1891 STEAM-POWERED DERRICKS HAD ALMOST COMPLETELY REPLACED HAND- AND HORSE-POWERED ONES: of 96 in use, 6 were hand-powered, and 7 were horse-powered (1, p. 42).

FIRST USE OF ELECTRICITY, introduced by Bedford Stone Quarries Company (1, p. 44).

1893 FIRST ELECTRIC GENERATOR INSTALLED to provide electrical power for quarrying and milling operations (1, p. 44).

1895 STATUS OF INDIANA LIMESTONE IN BUILDING INDUSTRY: Used in
--25 states, 1 Canadian province, and D.C.
--200 residences in New York City
--more than 50 residences in Boston
--4 State Capitols (IN, IL, GA, NJ)
--numerous courthouses (26 in Indiana)
--numerous churches
--several Ohio and Mississippi River bridges
--monuments, including those at Chickamauga Battlefield (1, pp. 32-33).

NUMBER OF QUARRIES: 48 (1, p.34).

FIRST DIAMOND SAW INTRODUCED (1, p. 43).

1896 TURNING POINT IN THE TRANSITION OF THE INDIANA LIMESTONE INDUSTRY FROM PRIMARILY A QUARRY INDUSTRY TO ONE IN WHICH FABRICATION OF THE STONE WAS BECOMING SIGNIFICANT (1, p.70).

1897 EVANSVILLE AND RICHMOND RAILROAD COMPLETED THROUGH BEDFORD (1, p.94).

1898 Contract received for CONSTRUCTION OF THE ADMINISTRATION BUILDING ON ELLIS ISLAND (1, p. 86).

1898 PRODUCTIVITY FIGURES: 1,391 men produced 5,630,046 cu ft, or 4,047 cu ft/man (1, p. 144)

1900 The First Presbyterian Church established in 1819 built this OLDEST STANDING CHURCH BUILDING within Bloomington City limits (at 6th and Lincoln) using rusticated Indiana Limestone (3, p. 32).

1901 FIRST USE OF COMPRESSED AIR FOR CHANNELING MACHINES (1, p. 109).

1905-06 WALLS OF INNER COURT OF HOUSE OF REPRESENTATIVES OFFICE BUILDING AND SENATE OFFICE BUILDING CONSTRUCTED OF INDIANA LIMESTONE (1, p. 86).

1906 FIRST YEAR IN WHICH INDIANA DIMENSION LIMESTONE PRODUCTION EXCEEDED 50% OF TOTAL U. S. PRODUCTION (1, p. 82). (NOTE: In only 10 years since has Indiana's production dropped below 50%).

1907 PNEUMATIC TOOLS BEGAN TO REPLACE MALLET AND CHISEL FOR CUTTING AND CARVING STONE (1, p. 116).

1908 THIRD MONROE COUNTY COURTHOUSE dedicated; built completely of Indiana Limestone (except for some interior trim) in the Beaux-Arts Classical style with involvement of the following STONE CARVERS:
--the statuary grouping over south entrance, "Light of the World," by Albert Molnar, Sr., a Hungarian who eventually settled in the area
--the Grand Army of the Republic Monument (SE corner of square) of 1928 designed by George W. Bunting and carved by Henry McIlveen and Joseph Graf, local carvers.
--the World War II memorial, "The Fighting Yank," (NE corner of square) by Harry Donato (3, pp. 28-29; 4, p. 1).

1911 FIRST FEDERAL GOVERNMENT BUILDING CONSTRUCTED ENTIRELY OF INDIANA LIMESTONE--the Bureau of Printing and Engraving, Washington, DC (1, p. 86).

1913 Indiana limestone industry claimed that INDIANA LIMESTONE HAD BEEN USED IN THE CONSTRUCTION OF 85% OF ALL COURTHOUSES AND PUBLIC BUILDINGS BUILT IN INDIANA IN THE PREVIOUS 20 YEARS (1, p. 87).

1913-14 ELECTRICAL TRANMISSION LINES EXTENDED INTO THE INDIANA LIMESTONE DISTRICT (Oolitic--1913; Bloomington and Ellettsville--1914) (1, p. 119).

1914 June 30, BLOOMINGTON SOUTHERN RAILWAY opened, running from Bloomington 8.83 mi southwest to quarries near Victor (1, p. 93).

PRODUCTIVITY FIGURES: 1,106 men produced 7,929,000 cu ft, or 7,150 cu ft/man (1, p. 144).

1914	WASTE STONE: estimated at 50% (i.e. amount of solid cutstone left from original quarried stone) (1, p. 175).
1916	25% OF STONE SOLD IN THE INDIANA LIMESTONE DISTRICT WAS BEING CUT BY DISTRICT MILLS (1, p. 97).
1917	ADOPTION OF A MORE SCIENTIFIC GRADING SYSTEM for characterizing Indiana Limestone (1, p. 177).
c. 1918	ILLINOIS CENTRAL FROM EFFINGHAM TO INDIANAPOLIS COMPLETED THROUGH BLOOMINGTON (1, p. 92; 2, p. 4).
1918	PROPORTION OF INDIANA LIMESTONE PRODUCED IN LAWRENCE COUNTY: --Rough stone: 73%; Dressed (cut/sawed): 90%.
	ACTIVE QUARRIES: 35; SAWMILLS: 12; CUTSTONE MILLS: 36 (1, p. 147).
1922-32	DECADE OF DOMINANCE OF INDIANA LIMESTONE (over 85% of all dimension limestone produced in U. S. produced in the Indiana limestone district) (Appendix I, this paper).
1926	Beginning of major consolidation of companies in the Indiana limestone district with the organization of the INDIANA LIMESTONE COMPANY--MAY 21--merging of 24 companies (1, p. 268).
1928	YEAR OF PEAK PRODUCTION OF INDIANA LIMESTONE: 14.5 MILLION CU FT (Appendix I, this paper).
1930	PROMOTION OF SPLIT-FACE STONE AS VENEER IN RESIDENTIAL CONSTRUCTION BEGUN IN EARNEST (by Bloomington Limestone Company which held the 1923 patent on the shearing machine required to produce it) (1, p. 308).
	BEGINNING OF SWITCH TO TRUCKING INDUSTRY FOR TRANSPORTING STONE TO MARKETS (most of which were within 300 miles for this split-face stone) (1, p. 309).
1931	EMPIRE STATE BUILDING COMPLETED (FACED WITH INDIANA LIMESTONE) (see any encyclopedia).
1933	NUMBER OF QUARRIES: 19; SAWMILLS: 13; CUTSTONE MILLS: 44 (1, p. 261).
1943	YEAR OF MINIMUM PRODUCTION BY INDIANA LIMESTONE INDUSTRY IN 20TH CENTURY: 800,000 cu ft.
1955	POST WORLD WAR II PRODUCTION PEAK: 8,200,000 cu ft.
1982	MINIMUM PRODUCTION SINCE WORLD WAR II: 1,500,000 cu ft.
1983-88	POST-1981-82 RECESSION RESURGENCE
1988	PEAK PRODUCTION SINCE 1982: 2,300,000 cu ft.

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